WTCI-22-P

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12-5-78 REC'D BY J. SCHWARTZMAN. COPIES TO CHIRCO, MONTALBANO, DOVELETIAN.

Mr. Malcolm P. Levy
Port Authority of New York and New Jersey
World Trade Department
1 World Trade Center
New York, N.Y. 10048

RE: WORLD TRADE CENTER
CONCOURSE LEVEL EGRESS

Dear Mal:

In response to Stanley Johnson's letter of April 3, 1975, addressed to Mr. Joseph Solomon, and with reference to the meeting held at the Port Authority office on Thursday, June 5, attended by Messrs. Roberts, Johnson and the writer, we wish to give you our detailed analysis of the occupancy data, and egress facilities as indicated on the accompanying drawing, no. CP 1. Determination of occupancy data as well as the ingress and egress loads are based upon the provisions of the New York City Administrative Code.

The entire Concourse has been treated as an exit passageway as defined in said code, except that by previous Port Authority decision, sprinkler protection in this area has been confined to the store areas. No sprinkler protection is being provided in the public passageways of the Concourse, as directed by the Port Authority.

The occupancy of the store area is based on calculations previously approved by the New York City Building Department for use in establishing store occupancies, i.e., 75% of the gross area of the stores has been assumed to be occupiable, with the occupancy based on an area of 25 sq. ft. per person.

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The restaurant capacities have either been based on the stated occupancy as obtained from the tenant designer or, as in the case of the G13 space, it was based on a calculated occupancy of 425 patrons and 75 restaurant personnel.

Bank occupancies have been based on an allowance of 100 sq. ft. of gross floor area per person.

The following stores have not been included in the above calculations, since either all or some of the occupants will have direct access to the street:

A4, G9 thru G13 and an assumption of 25 out of the total of 338 occupants for store B4.

Stores G1, G2 and G3 have access to Tower 'B' lobby only, and the occupants have not been included in the total figure of Concourse occupancy. Similarly, the occupants of the World Trade Information Center, who have access to Tower 'A' lobby only, have not been included in the population totals of the Concourse.

Based on the above, the number of occupants for store areas has been calculated at 4,680 persons; for bank areas at 325 persons. Total Concourse area occupancy: 5,005 persons.

In addition to the above, 13 building stairs, (including the stairs leading from the International Plaza Mezzanine) discharge into the Concourse. The total calculated number of persons entering the Concourse from these stairs has been established at 1,740.

Assuming that a total of 8 escalators from the PATH terminal (120 persons each) will be discharging patrons into the Concourse during the morning rush-hour, 960 persons will also enter this level.

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In the absence of more detailed information, we have assumed that each of the 5 subway stairs will discharge 300 persons for a total subway-rider influx of 1,500 persons.

Assuming that the maximum conditions would prevail, that is, that the subways and PATH trains would discharge a maximum number of persons, (a condition which will occur at most only during the height of the morning rush-hour), and that all stores, restaurants and banks will be occupied to the limit of their capacity, (a condition that will hardly ever occur simultaneously with the rush-hour), the Concourse might be occupied by a total of 9,205 persons.

Based upon the New York City Building Code allowance for passages, ramps and/or doors, exits A thru I could accommodate a total of 9,940 persons, indicating an excess capacity of egress facilities over total occupancy of 735 persons. The above calculations merit the following detailed comments:

the egress cap was based on 10640 persons

Exit A. We have assumed that four 3-foot-wide doors will connect the Concourse with the future hotel, thus allowing indirect exits from the Concourse through the hotel lobby to the street.

Exit B. Combined egress facilities for Tower 'B' lobby and mezzanine will accommodate 1,600 persons. However, only 1,040 persons can be discharged from Tower 'B' lobby if, during an emergency, both escalators between the lobby and mezzanine will either run in an upward direction or will be stopped.

Since some store occupants will also use the Tower 'B' lobby for exiting to the street, we have allowed only a total of 1,000 persons to discharge through the Tower 'B' lobby.

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Exit C. The allowance of 1,500 persons is based upon the width of the passages to the Liberty Street stairs which are more restrictive than the number of doors provided at the Liberty Street level.

It would be the recommendation of this office that the north-south passage to the International Plaza which provides a view of the Liberty Street exit be kept open during the times of maximum occupancy of the Concourse so as to provide a visual connection between the Concourse and the Street.

Exit D. Capacity determined by number of 3'-0" wide doors at street level.

Exit E. Based on preliminary information, we have assumed that the U.S. Steel Building exit will accommodate 300 persons.

Exit F. Based on preliminary information, we have assumed that the BMT underpass will accommodate 350 persons.

Exit G. The connection between the IND Subway and the Concourse has a total of 11 3-foot-wide double acting doors. We have assumed that these doors will be used as egress facilities in case of emergency at the Concourse level since ample underground holding areas as well as street exits are available at this IND station.

As part of this report, we recommend that a public address system be installed at this IND entrance/exit facility, so as to warn persons wanting to enter the Concourse during an emergency situation to seek alternate ways to reach their destination.

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Exit H. The total capacity of this exit has been limited to 590 persons because of restrictions imposed by the limited number of doors at the Southeast Plaza Building upper and lower lobby. To reach this capacity would require that both escalators between the Concourse and Southeast Plaza lobby would either be stopped or run in an upward direction during times of required maximum egress.

Exit I. Since an undetermined number of persons will use Tower 'A' lobby to exit from the World Trade Information Center, we have assumed that only 1,000 Concourse occupants can be accommodated for egress purposes through Tower 'A' lobby. As in the case of Tower 'B', this would require both escalators either be stopped or run in an upward direction during times of required maximum egress.

Exit J. As discussed in the meeting of June 5, the stair now terminating at the Concourse International Plaza level would have to terminate at the Plaza level instead, so that the stair connecting the Concourse level with the Plaza could be utilized as an egress stair. (This will require changing the swing of stair door at the Concourse level and the installation of an exit light over the door).

General Comments.

It is important that all graphics directing occupants to exits be easily discernable in addition to giving explicit instructions as to the location of egress facilities. Conversely, it is of equal importance that all doors not leading to exits be so identified. In addition, a public address system adding audible instructions to the visual impact of the graphics should be installed so that locations of possible emergency conditions could be identified and the public be instructed to take proper precautions, (please note our specific comments for Exit G.)

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We hope that the above will give you the information desired. We remain ready to discuss more detailed suggestions at any time.

The above report does not address itself to the possible changes which may be required for the operation of the Tower 'B' Observation Deck. We believe a separate study should be undertaken once the Port Authority has decided how access to and exit from the roof is to be provided.

Very truly yours,

EMERY ROTH & SONS

FRED HALDEN

FH:srf
enc.

cc: H. Roberts/PANYNJ
J. Carlock/PANYNJ
S. Johnson/PANYNJ